We claim:

1. A method of forming a fire door core, comprising the steps of:

a) depositing into a mold a mixture of exfoliated vermiculite, a resin and a hydraulic binder, the mold being maintained at a temperature less than the reaction temperature of the resin;

b) transferring the mold and thereby the mixture to a heated press;

c) applying to the mixture through the press a predetermined pressure at a predetermined temperature for a predetermined period sufficient to harden the mixture into a slab; and

d) removing the hardened slab from the mold.

2. The method of forming a fire door core as in claim 1, including the step of:

a) forming the mixture by mixing the hydraulic binder and resin into a submixture and mixing the submixture with the exfoliated vermiculite.

3. The method of forming a fire door core as in claim 2, including the step of:

a) forming the mixture from about 20% by weight to about 40% by weight hydraulic binder, from about 5% by weight to about 15% by weight resin, and with the balance being vermiculite.

4. The method of forming a fire door core as in Claim 2, including the step of:

a) blending the vermiculite and submixture gently prior to depositing the mixture into the mold.

5. The method of forming a fire door core as in claim 2, including the step of:

a) adding a release agent to the submixture, the release agent being from about 1% by weight of the resin bonded exfoliated vermiculite mixture.

6. The method of forming a fire door core as in claim 1, including the step of:

a) maintaining the mold at a temperature less than the reaction temperature of the resin while the mixture is being deposited into the mold.

7. The method of forming a fire door core as in claim 6, including the step of:

a) applying substantially 150-1200 p.s.i. pressure to the mixture in the mold through the press.

8. The method of forming a fire door core as in claim 7, including the step of:

a) applying from about 150 to about 400 p.s.i. pressure and thereby forming a low density core.

9. The method of forming a fire door as in claim 7, including the step of:

a) applying from about 800 to about 1200 p.s.i. pressure and thereby forming a core having a density of from about 900 to about 1,300 kg/m^3.

10. The method of forming a fire door core as in claim 7, including the step of:

a) heating the mixture to a temperature above the reaction temperature of the resin for a period sufficient to react the resin and harden the mixture into a slab.

11. The method of forming a fire door core as in claim 10, including the step of:

a) maintaining the mixture in the mold at a temperature less than the resin curing temperature prior to placing the mold in the press.

12. The method of forming a fire door core as in claim 2, including the step of:

a) applying a surface release agent to the mold.

13. The method of forming a fire door core as in claim 1, including the step of:

a) impregnating the slab by immersion in water or absorption by steam.

14. The method of forming a fire door core as in claim 13, including the step of:

a) applying a vacuum to the slab before it is immersed in the water.

15. The method of forming a fire door core as in claim 13, including the step of:

a) immersing the slab in the water or allowing the slab to absorb steam for a period sufficient to hydrate the hydraulic binder.

16. The method of forming a fire door core as in claim 15, including the step of:

a) providing hemi-hydrated gypsum as the hydraulic binder, and immersing the slab for a period sufficient to convert the hemi-hydrated gypsum to hydrated gypsum.

17. The method of forming a fire door core as in claim 16, including the step of:

a) drying the slab to a moisture content of from about 10% to about 14% by weight water.

18. The method of forming a fire door core as in claim 17, including the step of:

a) maintaining the gypsum as hydrated gypsum.

19. The method of forming a fire door core as in claim 1, including the step of:

a) selecting the resin from the group consisting of novolac resins, and selecting the hydraulic binder from the group consisting of gypsum, synthetic gypsum, hydrated gypsum, Portland cement, high alumina cement, gypsum cement, α-calcium sulphate hemihydrate, β-calcium sulphate hemihydrate, magnesium oxychloride, magnesium oxysulphate, calcium sulphoaluminate cement, an alkali silicate, ground granulated blast furnace slag, and mixtures of any two or more of the foregoing.

20. The method of forming a fire door core as in claim 19, including the step of:

a) blending fibers in the mixture.

21. The method of forming a fire door core as in claim 20, including the step of:

a) selecting the fibers from the group consisting of glass fibers, chopped strand glass fibers, inorganic fibers, and Dralon fibers.

22. The method of forming a fire door core as in claim 19, including the step of:

a) providing sufficient vermiculite to achieve a mixture having from about 50% by weight to about 85% by weight vermiculite.

23. The method of forming a fire door core as in claim 13, wherein:

a) the slab has a density from about 350 kg/m^3 to about 600 kg/m^3.

24. A door core forming system, comprising:

a) a plurality of raw material sources;

b) a mixing system, said mixing system in communication with said raw material sources;

c) a plurality of molds, each mold for operative communication with said mixing system for receiving a predetermined supply of mixed raw materials;

d) a vibratory assembly for receiving each of said molds and causing the mixed raw materials to achieve a substantially uniform density in the associated mold;

e) a heated press in operative association with said vibratory assembly for receiving the filled molds and applying sufficient heat and pressure for a

sufficient period to cause the mixed raw materials to achieve a slab having a hardened state.

25. The system of claim 24, further comprising:;

a) a water impregnation assembly operatively associated with said press for impregnating the hardened slabs with water or steam; and

b) a drying assembly operatively associated with said water impregnation assembly for drying the slabs to a predetermined moisture content

26. A method of forming a hardened slab of resin bonded vermiculite and hydraulic binder, comprising the steps of:

a) depositing into a mold a mixture of exfoliated vermiculite, a resin and a hydraulic binder, the mold being maintained at a temperature less than the reaction temperature of the resin;

b) transferring the mold and thereby the mixture to a heated press;

c) applying to the mixture through the press a predetermined pressure at a predetermined temperature for a predetermined period sufficient to harden the mixture into a slab having a density of from about 350 kg/m^3 to about 1,300 kg/m^3; and

d) removing the hardened slab from the mold.

27. The method of forming a hardened slab of resin bonded vermiculite and hydraulic binder as in claim 26, further comprising the step of:

a) applying substantially 800-1200 p.s.i. pressure to the mixture in the mold through the press and thereby forming a hardened slab having a density of from about 900 to about 1,300 kg/m^3.

28. The method of forming a hardened slab of resin bonded vermiculite and hydraulic binder as in claim 26, further comprising the step of:

a) reducing the hardened slab into at least first and second strips for fire door support structures.

29. The method of claim 26, including the step of:

a) providing up to 10% by weight of the exfoliated vermiculite from recycled vermiculite materials.